Remarks

Reconsideration of the above-identified application is respectfully requested.

The application contains Claims 1-19 and new Claims 20-21.

Claims 1-19 have been rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement. The claims use the language "containing four or less β-1,6-bound glucose units." The Examiner believes that the specification as filed, does not support this limitation.

At page 4, lines 9-16 of the specification, it is stated "the resulting enzyme treated glucan can be characterized as a branched β-1,3-glucan with β-1,3-linked side chains being attached by a β-(1-6)-linkage and being essentially free of β-1,6-link chains. In this connection the phrase "β-(1-6)-chains" is meant to include branches of more than one β-(1-6)-link glucose units. The β-(1-6)-glucanase linkage insures that most chains of more four β-(1-6)-bound glucose units are cleaved off."

The "four or less" phrase in the claims is derived from the last sentence of the above quote and is supported by the following interpretation. The β-(1-6)-glucanase used in the present application facilitates the cleavage of β-1,6-linkages where the end products after infinite processing time is gentibiose (two glucose units attached by β-1,6-linkage) and gentiotriose (three glucose units), whereas after limited processing time the resulting products would include gentiotetraose (four glucose units). This information is known in the art. This also implicates that the enzyme does not act on chains smaller than tetramers, translating to a remaining chain length of maximum four glucose units and downwards where the enzyme has been able to act.

Further, in this specification it is stated "the β-(1,6)-glucanase enzyme cleavage ensures that most chains are more than four β-(1-6)-bound glucose units are cleaved off," and the Examiner has made a note of "most chains." The description of the resulting product after enzymatic degradation is utilized because when the object of the action of an enzyme is of a particulate nature, there are few guarantees that absolutely all chains within the inner part of the particle are accessible for enzymatic degradation. It is definitive, however, is that all chains at the surface of the particle have been degraded by the enzyme, and it is these extending β-1,6-glucan chains that would be decisive for the biological activity of the particle. By removing these the present invention has demonstrated that the resulting particle has increased biological activity because the particle would then present more β-1,3-linked chains available for interaction with receptors on the target immune cells. Accordingly, one skilled in the art would be knowledgeable about the art, and recognize the foregoing, therefore the noted claim language should be acceptable.

Claims 1-19 has been rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to point out and claim the invention for the recitation of the phrase "essentially free." The Examiner believes that it is not clear what percentage of β-1,6-link chains must be eliminated for a particular glucan to be considered essentially free of such chains.

One skilled in the art would recognize the explanation concerning the number of glucose units and therefore, recognize the phrase "essentially free" as being compatible with the interpretation found in the specification and claims.

Claims 1, 4, 5, 7, 9, 10, 13, 14 and 16-19 have been rejected under 35 U.S.C. § 102(b) as being anticipated by the Shiota et al. reference. The β-(1,6)-glucanase used by the Shiota et al. reference is from a different microorganism then from the claimed β-(1,6)-glucanase. Further, the claimed invention relates to a glucan comprised of β-(1,3)-linked glucose units and is essentially free of β-(1,6)-linked chains apart from those chains of four or less β-(1,6) bound glucose units. This feature distinguishes the claimed invention from the Shiota et al. reference and therefore, the Shiota et al. cannot anticipate the presently claimed invention.

Claims 1-3 have been rejected under 35 U.S.C. § 103 as being unpatentable over the Shiota et al. reference and the de La Cruz et al. reference.

Neither the Shiota et al. reference nor the de La Cruz et al. reference is directed to a process for preparing the glucan of the presently claimed invention. The glucan product produced by the alleged combination of the Shiota et al. and de La Cruz et al. references is not and would not leave one skilled in the art to the process for preparing a glucan comprised of β-(1,3)-linked glucose units as essentially free of β-(1,6)-linked chains apart from those chains of four or less β-(1,6) bound glucose units.

Several of the remaining claims have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Shiota et al. reference in view of additional references, for example, the Jamas reference, U.S. Patent No. 5,028,703, the Matsueda et al. reference. Regardless of the secondary citations that may be used with the Shiota et al. reference, the Shiota et al. reference is deficient in anticipating or rendering obvious the presently claimed invention. Neither the Shiota et al. reference and none of the secondary references disclose a process for preparing a glucan comprised of β-(1,3)-linked glucose units essentially free of β-(1,6)-link chains apart from those chains of four or less β-(1,6) bound glucose units. No matter what microorganism is used, no matter what solubilizing agent is used, no matter what enzymatic treatment is used, the currently claimed invention is divergent from the teachings of the prior art. As previously exclaimed, none of the prior art taken singularly or in combination disclose or anticipate a "resulting glucan comprised of β-(1,3)-linked glucose units that is

essentially free of β-(1,6)-linked chains apart from those chains of four or less β-(1,6) bound glucose units, as claimed.

New claims 20-21 relate to a method of increasing immunostimulation in fish, which would increase weight gain by the administration of the claimed glucan of the present invention. Support for this claim and the immunostimulatory glucan is found in the specification and the examples, particularly examples 1-4. Clearly the prior art does not teach or suggest or anticipate Claims 20-21.

An Information Disclosure Statement is being submitted herewith.

In view of the foregoing comments and new claims, Applicants submit that the claims meet the requirements of 35 U.S.C. An early Notice of Allowance is respectfully requested.

Respectfully submitted,

January 9, 2004
Date

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